WHAT IS CLAIMED IS:

1.   A method comprising augmenting partially sampled field of view data using fully sampled field of view data.

2.   A method in accordance with Claim 1 wherein said augmenting comprises estimating a distribution of missing projection data.

3.   A method in accordance with Claim 2 wherein said estimating comprises using projection data acquired from neighboring detector rows.

4.   A method in accordance with Claim 2 wherein said estimating comprises calculating boundary parameters, p_l and p_r, for a truncated projection, in accordance with $p_l = \dfrac{1}{m} \sum_{i=1}^{m} p(i,k)$ and $p_r = \dfrac{1}{m} \sum_{i=1}^{m} p(N - i,k)$, where m is a number of samples used, N is a number of detector channels, and k is a projection view index.

5.   A method in accordance with Claim 4 wherein m is a number in a range from about 1 to about 5.

6.   A method in accordance with Claim 2 wherein said estimating further comprises calculating slopes, s_l and s_r, by fitting n samples near a plurality of points of truncation with a first order polynomial.

7.   A method in accordance with Claim 6 wherein n is a number in a range from about 2 to about 8.

8.   A method in accordance with Claim 6 wherein n is a number in a range from about 3 to about 7.

9.   A method in accordance with Claim 6 wherein slopes, s_l and s_r, are weighted averages of values calculated from a plurality of detector rows.

10. A method in accordance with Claim 1 further comprising: scanning an object to obtain fan beam detector data from a plurality of rotation angles around the object; and

re-ordering the fan beam detector data into sets of data with parallel sampling paths across the field of view.

11. A method in accordance with Claim 10 further comprising summing each parallel path set of data to obtain a path attenuation value for each angle.

12. A method in accordance with Claim 11 further comprising estimating a total integral attenuation of the object using a maximum attenuation path.

13. A method in accordance with Claim 12 further comprising estimating an amount of truncated integral attenuation in paths with attenuation less than the maximum attenuation path.

14. A method in accordance with Claim 13 further comprising calculating a magnitude and a slope at a point of truncation.

15. A method in accordance with Claim 14 further comprising estimating a distribution of a truncated projection using the calculated magnitude and slope.

16. A method in accordance with Claim 15 wherein said augmenting further comprises augmenting the partially sampled field of view data by adding the estimated distribution to the partially sampled field of view data.

17. A method in accordance with Claim 1 further comprising providing a delineation in a reconstructed image between areas representative of the fully sampled field of view data and the partially sampled field of view data.

18. An imaging apparatus comprising:

a radiation source;

a detector responsive to radiation positioned to receive radiation emitted from said source; and

a computer operationally coupled to said radiation source and said detector, said computer configured to:

receive data from a CT scan of an object, the data including fully sampled field of view data and partially sampled field of view data;

augment the received partially sampled field of view data using the fully sampled field of view data; and

reconstruct an image of the object using the fully sampled field of view data and the augmented partially sampled field of view data.

19.   An apparatus in accordance with Claim 18 wherein said computer is further configured to estimate a distribution of missing projection data.

20.   An apparatus in accordance with Claim 19 wherein said computer is further configured to estimate a distribution of missing projection data using projection data acquired from neighboring detector rows.

21.   An apparatus in accordance with Claim 19 wherein said computer is further configured to calculate boundary parameters, p_l and p_r, for the partially   sampled   field   of   view   data,   in   accordance   with $p_l = \dfrac{1}{m}\sum_{i=1}^{m} p(i,k) \ and \ p_r = \dfrac{1}{m}\sum_{i=1}^{m} p(N-i,k)$, where m is a number of samples used, N is a number of detector channels, and k is a projection view index.

22.   An apparatus in accordance with Claim 19 wherein said computer is further configured to calculate slopes, s_l and s_r, by fitting n samples near a plurality of points of truncation with a first order polynomial.

23. An apparatus in accordance with Claim 22 wherein said computer is further configured to estimate slopes, s_l and s_r, as weighted averages of values calculated from a plurality of detector rows.

24. An apparatus in accordance with Claim 18 wherein said computer is further configured to scan an object to obtain fan beam detector data from a plurality of rotation angles around the object; and to re-order the fan beam detector data into sets of data with parallel transmission paths across the field of view.

25. An apparatus in accordance with Claim 24 wherein said computer is further configured to sum each parallel path set of data to obtain a path attenuation value for each path.

26. An apparatus in accordance with Claim 25 wherein said computer is further configured to estimate a total integral attenuation of the object using a maximum attenuation path.

27. An apparatus in accordance with Claim 26 wherein said computer is further configured to estimate an amount of truncated integral attenuation in paths with attenuation less than the maximum attenuation path.

28. An apparatus in accordance with Claim 27 wherein said computer is further configured to calculate a magnitude and a slope at a point of truncation.

29. An apparatus in accordance with Claim 28 wherein said computer is further configured to estimate a distribution of a truncated projection using the calculated magnitude and slope.

30. An apparatus in accordance with Claim 29 wherein said computer is further configured to augment the partially sampled field of view data by adding the estimated distribution to the partially sampled field of view data.

31.   An apparatus in accordance with Claim 29 wherein said computer is further configured to provide a delineation in a reconstructed image between areas representative of the fully sampled field of view data and the partially sampled field of view data.

32.   A computer readable medium encoded with a program configured to instruct a computer to:

augment partially sampled field of view data using fully sampled field of view data; and

reconstruct an image using the fully sampled field of view data and the augmented partially sampled field of view data.

33.   A medium in accordance with Claim 32 wherein said program is further configured to instruct the computer to estimate a distribution of missing projection data.

34.   A medium in accordance with Claim 33 wherein said program is further configured to instruct the computer to estimate a distribution of missing projection data using projection data acquired from neighboring detector rows.

35.   A medium in accordance with Claim 33 wherein said program is further configured to instruct the computer to calculate boundary parameters, p_l and p_r, for said partially sampled field of view data, in accordance with $p_l = \dfrac{1}{m}\sum_{i=1}^{m} p(i,k)$ *and* $p_r = \dfrac{1}{m}\sum_{i=1}^{m} p(N-i,k)$, where m is a number of samples used, N is a number of detector channels, and k is a projection view index.

36.   A medium in accordance with Claim 33 wherein said program is further configured to instruct the computer to calculate slopes, s_l and s_r, by fitting n samples near a plurality of points of truncation with a first order polynomial.

37.   A medium in accordance with Claim 36 wherein said program is further configured to instruct the computer to estimate slopes, s_l and s_r, as weighted averages of values calculated from a plurality of detector rows.

38.   A medium in accordance with Claim 32 wherein said program is further configured to instruct the computer to scan an object to obtain fan beam detector data from a plurality of rotation angles around the object; and to re-order the fan beam detector data into sets of data with parallel transmission paths across the field of view.

39.   A medium in accordance with Claim 38 wherein said program is further configured to instruct the computer to sum each parallel path set of data to obtain a path attenuation value for each path.

40.   A medium in accordance with Claim 39 wherein said program is further configured to instruct the computer to estimate a total integral attenuation of the object using a maximum attenuation path.

41.   A medium in accordance with Claim 40 wherein said program is further configured to instruct the computer to estimate an amount of truncated integral attenuation in paths with attenuation less than the maximum attenuation path.

42.   A medium in accordance with Claim 41 wherein said program is further configured to instruct the computer to calculate a magnitude and a slope at a point of truncation.

43.   A medium in accordance with Claim 42 wherein said program is further configured to instruct the computer to estimate a distribution of a truncated projection using the calculated magnitude and slope.

44.   A medium in accordance with Claim 43 wherein said program is further configured to instruct the computer to augment the partially sampled field of view data by adding the estimated distribution to the partially sampled field of view data.

45.   A medium in accordance with Claim 32 wherein said program is further configured to provide a delineation in a reconstructed image between areas representative of the fully sampled field of view data and the partially sampled field of view data.